APPENDIX E
VEGETATION

SIMPPLLE

OVERVIEW

SIMPPLLE, Simulating Patterns and Processes at Landscape scaLEs, is the acronym for a computer simulation modeling system that simulates vegetation patterns and processes emphasizing the dynamics of landscape level change. It was developed for the USDA Forest Service, Region One as a management tool. In general, its purpose is to help provide an understanding of the dynamics of where processes will occur across a landscape.

SIMPPLLE was selected for use by the DFO because it is both spatially and temporally explicit so that landscape level vegetation change can be explored in relation to location and neighboring plant communities as well as over time. Forested and non-forested vegetation is described in the model using species, canopy closure, and size-class/structure (Lee et. al. 2003). Probabilities of processes such as wildfire, beetles, rusts, defoliators, and root disease influence how the vegetation changes; management treatments influence both vegetation change and processes; conditions in neighboring communities (polygons) influence process spread. The model is able to incorporate existing vegetation information provided in GIS coverages and display vegetation change, process probability, and spread in map form. The model developers were able to interact with the BLM through an interagency agreement in order to help develop the landscape analysis specific to the Dillon Field Office landscape within the framework of the RMP. The SIMPPLLE modeling approach provided a tool for developing management alternatives on a landscape that considers the implications of landscapes from both a spatial and a temporal perspective. It displays the interactions between different processes and the effect of management decisions over time (Lee et.al. 2003).

Preliminary work included completing GIS coverages from the Forest Service SILC3 imagery so that the most complete baseline data available could be used for SIMPPLLE input. Next a template was developed that divided vegetation into moisture/temperature classes for use in further data analyses. The analysis structure was to lump vegetation species together, then calculate the minimum, maximum and average to display a range of variability. The simulations began with 12 groups and eventually ended up in 3 groups composed of warm-dry (WD), cool-moist (CM), and nonforest (NF).

THE SIMPPLLE MODELLING PROCESS

SIMPPLLE generates a range of possible outcomes for landscapes that can be quantified through multiple simulations. Multiple simulations can provide a prediction of general trends for the processes on a specific landscape. Results from multiple simulations can be expressed as a probability of occurrence for the disturbance processes as well as the attributes by which plant communities are described. Individual simulations can be used as an example of one possible outcome of a given landscape. Individual simulations can be selected from a set of multiple simulations to represent worst-case scenarios for specific disturbance processes, a most likely scenario, or a most optimistic scenario.

Specifically SIMPPLLE's purpose is to provide a user with the ability to:

1. Simulate future vegetation changes caused by disturbance processes at multiple landscape scales.
2. Simulate ranges of conditions of plant communities and processes at multiple landscape scales.
3. Simulate how changes in vegetation patterns influence the activity of fire, insect and disease processes.
4. Simulate management treatment alternatives for their impact on disturbance processes and the attainment of desired conditions defined at landscape scales.
5. Help identify areas that have a high priority for treatments that can help achieve and sustain desired conditions at landscape scales.
6. Simulate impacts over time on a variety of resource objectives that can be defined by a combination of vegetation conditions and spatial attributes.
7. Provide a basis for identifying the probability of disturbance processes and vegetation conditions.

TREATMENT ALTERNATIVES

Encroachment

There are differences in how plant regeneration occurs in the forest and nonforest pathways in SIMPPLLE. The regeneration function is invoked in the forest communities when a process such as stand replacing fire (SRF) sends a community to a temporary nonforest state, such as Native Forbs; the model "looks" for a neighboring tree seed source. If a neighboring seed source exists, then the community begins the regeneration process and the vegetation species that is represented by that neighboring seed source grows

in the stand. Weed and conifer encroachment is a process that occurs on the nonforest habitat types; this only occurs under specific conditions outlined in the Draft SIMPPLLE Users's Guide.

Historic Fires

The Beaverhead-Deerlodge (B-D) Fire Management Zones (FMZ) file was used - with some alterations in order to incorporate fire behavior on BLM lands. The FMZ file and associated code in the GIS coverage did not allow for fire on non-Forest Service lands.

Agriculture

The need to remove agriculture from the historic simulations was discussed, but there is not any on BLM lands.

Quaking Aspen

An aggressive approach, regardless of alternative, was taken to increase Quaking Aspen, although more areas were treated in Alternative D. Quaking Aspen is treated using mechanical (liberation cut) and fire in non-Wilderness Study Areas and fire only in Wilderness Study Areas; an aggressive treatment was incorporated across all decades in order to reduce conifer encroachment on nonforest habitat types.